Catalogue no. 11F0026MIE — No. 003
ISSN: 1709-7177
ISBN: 0-662-39794-0

Research Paper

Economic analysis methodology paper series: National Accounts

Canada/U.S. Labour Productivity Revisions in the Business Sector

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This paper represents the views of the authors and does not necessarily reflect the opinions of Statistics Canada.

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March 2005

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Published by authority of the Minister responsible for Statistics Canada

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Abstract

This paper examines the revision cycle for labour productivity estimates over the period 2000-2003.

Introduction

The estimates of labour productivity (output per hour worked) that are produced by the Canadian Productivity Accounts are subject to two types of revisions.

The first is a set of short-run revisions in GDP that take place over a four-year cycle. This set of revisions follows those that the National Accounts pursues for its preliminary estimates of GDP. A preliminary estimate of GDP that is first released for year t is revised annually over the three subsequent years (t+1 to t+3) as more and more data become available to the National Accounts.

Initially, estimates of GDP at the industry level come from projecting past estimates using a small number of readily measured series (for example, the GDP in Taxi and Limousine Services is projected off the Labour Force Survey estimate of employment growth in these industries). The industry estimates are gradually supplemented by far more detailed and accurate data that are obtained from surveys like the Survey of Manufactures, the United Enterprise Surveys and administrative tax records that become available after a lag of several years. Estimates of GDP that are calculated from final demand are also initially projected from sources that are eventually replaced by more comprehensive information. For example, preliminary data on expenditures that come from Retail surveys are eventually updated with the more comprehensive survey of household spending. Preliminary data on non-residential construction that are projected using employment in construction are updated at a later data with data from an investment survey.

In addition, the labour productivity estimates for year t are revised in year t+1 as new information becomes available to improve the first estimates of employment and hours worked that are made using the Labour Force Survey. These revisions improve the estimates of holidays and other non-random events.[1] Revisions also occur if the employment estimates for the non-commercial sector that are derived from Public Institutions Division and the Survey of Employment, Payroll and Hours (SEPH) are revised since the business sector estimate is obtained residually after removing the non-commercial sector.

The second type of revision occurs less frequently, when major revisions are made in methodology or as a result of updates in concepts. The National Accounts occasionally experiences major revisions due to historical updates, classification changes (for example, the movement from SIC to NAICS), or the introduction of conceptual and methodological changes. The latter occur when the National Accounts update the method used for measuring certain industries, perhaps because of changes in the international standards to which they adhere (the SNA93). For example, in the year 2000, Statistics Canada included software expenditures as investment for the first time.[2] When Laspeyres price indices were used to calculate constant dollar GDP, updating the base year from which weights were derived, occurred every five years and resulted in periodic revisions to growth rates. In addition, changes in analytical techniques, such as shifting to chain-Fisher indices, has introduced revisions in the labour productivity

1. See Jean-Pierre Maynard, "Annual Measures of the Volume of Work Consistent with the SNA: the Canadian Experience", Economic Analysis Methodology Paper Series.
2. The United States had made this change the year before.

estimates. Historical revisions also occur to the employment data when the Labour Force Survey is occasionally re-benchmarked to the Population Census data.

In this note, we compare recent revisions in the labour productivity estimates in both Canada and the United States. These regular revisions to preliminary estimates extend back four years.

Revisions of labour productivity estimates have recently (June 2004) been made in Canada in order to incorporate the latest available GDP estimates published by the National Economic and Financial Accounts.[3] These revisions relate to the last four years (2000 to 2003). The revisions back to 1997 are presented in Table 1, which shows a picture of the evolution of the estimates over the last six revision rounds since 1997. It should be noted that the revisions to the 2002 and 2003 estimates for Canada are not yet completed. This is also the case for the period 2001 to 2003 in the United States. Those cells that are shaded include the estimates during the first four-year revision cycle. Other revisions outside these shaded areas are due to the other sources of revisions outlined above.

For the purposes of this note, we focus our attention on the effect of revisions for two periods—1989-2000 and 2000-2003 (see Table 2). The second period is less than a business cycle in length and covers the years since the end of the previous peak in productivity growth and also corresponds to the period when only preliminary estimates of GDP are available. The former period contains estimates that are past the preliminary revision cycle, essentially covers a full business cycle and therefore provides a comparison of differences in long-run trends between Canada and the United States. Productivity estimates of short-term changes are generally more volatile than estimates of changes over a longer time horizon.

Revisions for 2000-2003

Overall, the revisions for the period 2000 to 2003 that were published in *The Daily*, June 11, 2004 increased the growth rate of labour productivity in Canada for each of the last four years. For that period, the upward revisions ranged from 0.1% to 0.4%, narrowing the gap in productivity growth between Canada and the United States.

According to this last round of revisions, Canadian businesses outperformed their American counterparts in productivity in only one of the past four years: 2000. As a result of the last round of revisions, the difference in productivity growth for the year 2000 increased from 0.9 percentage points in Canada's favour before revision (Table 1, line 10) to 1.0 percentage points after revision (Table 1, line 11). Since then, the gap in productivity growth varied from 1.2% to 4.4% per year in favour of the United States before revision, compared with 1.1% to 4.1% after revision. Over the period from 2000-2003, the average annual growth rate in Canada is now 1.4% and 3.8% in the United States (see Table 2). It should be noted that 2000-2003 is a short period and covers much less than a full business cycle. In the early 1990s, Canada also lagged the United States in productivity growth during a recessionary period, but ended up at approximately the same point by the end of the decade.

3. Recent productivity data are produced on the basis of preliminary GDP estimates, which are eventually revised when additional and more precise information on the National Accounts becomes available.

It is also important to note that the annual productivity differences over the period 2000-2003 are based on preliminary data, which are still subject to revision. Since 1998, the Canada/U.S. gap has generally shrunk following revisions to the preliminary data. The revision made to the Canadian productivity estimate in 1999 is almost entirely due to revisions in GDP. Almost half of the revision in 2000 also comes from this source.[4] During this period, the National Accounts has made two changes that increased the rate of growth of output and therefore of labour productivity. First, it started capitalizing software expenditures (the U.S. had introduced this in 1999). Second, it has gradually been introducing new surveys associated with the Project to Improve Provincial Economic Statistics (PIPES) that has extended coverage of its economic surveys.[5] During this period (in 2000, in particular), the productivity program also revised its estimate of hours worked downward.[6]

Although productivity growth in Canada during the last three years is persistently lower than it is in the United States, it grew at about the same pace in each country from 1989 to 2000. For this period, productivity has grown at an average annual rate of 1.8% in Canada, compared with 2.1% in the United States. The recent revisions (June 2004) to the productivity estimates had virtually no effect on average annual productivity growth in Canada for the period from 1989 to 2000. The average gap in annual productivity growth in favour of the United States declined from 0.79 percentage points when it was published for the first time in the Daily, May 1, 2001 to 0.30 percentage points after the SNA round of revisions were completed.

All things considered, the 2000 to 2003 revisions of GDP in Canada resulted in narrowing of the gap in productivity growth, without reversing the story that Canadian productivity growth lagged that of the United States during the first part of this decade, a period for which only preliminary data are mainly available. The revisions have had little effect on the Canada/US differences over the previous decade—from 1989 to 2000. During this period, Statistics Canada's estimates of productivity growth have consistently showed that Canada lagged less than one percentage point behind the United States. In early 2000, we compared the long-run performance of Canada to the United States[7] over the period 1989-1997 and reported that Canada lagged the United States by only a small amount. As of 1999, the average labour productivity growth of the business sector in Canada from 1989-1998 was 1.19%[8] while it was 1.34% in the United States[9] over the same period. In early 2000,[10] the Americans made major revisions to their National Accounts for much of the 1990s, increasing their average rate of productivity of growth between 1989 and 1998 to 1.89%. This widened the Canada/US difference from around 0.15% to over 0.60%. The revisions

4. The remainder came from a revision to the labour statistics.
5. The GDP revisions in 1999 and 2000 came from new benchmarks of manufacturing activity derived from the PIPES program, upward revisions in exports, and the incorporation of software as an investment rather than as an intermediate expenditure. In addition, the productivity program fully integrated its output measure with that produced by the Income and Expenditures Division.
6. The revisions in hours worked in 2000 came from new information on the methodology actually followed by the LFS survey for the year 2000 but not for other years. The information resulted in an upward adjustment in holidays in this year.
7. J. R. Baldwin, T. M. Harchaoui and J.-P Maynard. 2001. "Productivity Growth in Canada and the United States," In *Productivity Growth in Canada*. Catalogue 15-204. Ottawa. Statistics Canada. Chapter 4.
8. As of June 30, 1999.
9. As of October 1999.
10. As of April 9th, 2000

introduced by the United States increased the rate of growth because computer software was moved from intermediate expenditures to investment and because of a number of improvements in coverage, especially in trade. The recent Canadian revisions covering the years 1999 and 2000, incorporating similar changes on the software side and improvements in coverage due to PIPES, have moved the relationship for the entire 1990s back close to the level previously reported.

Table 1. Labour productivity comparison—business sector—Canada and United States—annual percentage change, 1997-2003

		Canada							United States							
	Daily release	1997	1998	1999	2000	2001	2002	2003	1997	1998	1999	2000	2001	2002	2003	BLS release
After the revisions round in 1997 (Annual)	**1999-03-23**	2.9	X	X	X	X	X	X	1.6	X	X	X	X	X	X	**Oct 1998**
After the revisions round in 1998 (Annual)	**2000-01-18**	2.8	0.6	X	X	X	X	X	1.4	2.4	X	X	X	X	X	**Oct 1999**
First estimates published for 1999 (Annual)	**2000-05-01**	2.4	0.5	1.4	X	X	X	X	2.1	2.7	3.2	X	X	X	X	**Oct 2000**
First estimates published for 2000 (4th Q)	**2001-03-29**	2.3	1.3	1.7	1.4	X	X	X	2.3	2.8	2.8	4.2	X	X	X	**2001-06-05**
After the revisions round of 2000 (1st Q)	**2001-06-25**	2.6	2.2	2.4	1.6	X	X	X	2.3	2.7	2.5	3.1	X	X	X	**2001-08-07**
First estimates published for 2001 (4th Q)	**2002-03-14**	2.6	2.1	2.4	1.5	1.2	X	X	2.3	2.7	2.5	3.4	2.0	X	X	**2002-05-31**
After the revisions round in 2001 (1st Q)	**2002-06-14**	2.6	1.7	2.9	2.1	0.8	X	X	2.3	2.6	2.6	3.0	1.1	X	X	**2002-08-09**
First estimates published for 2002 (4th Q)	**2003-03-14**	2.6	1.7	2.9	2.1	0.8	2.2	X	2.3	2.6	2.6	3.0	1.1	4.8	X	**2003-06-04**
After the revisions round in 2002 (1st Q)	**2003-06-12**	2.6	1.7	2.9	3.1	1.2	1.8	X	2.2	2.6	2.5	3.1	2.0	5.3	X	**2003-08-07**
First estimates published for 2003 (4th Q)	**2004-03-12**	2.6	1.4	3.3	3.8	1.0	1.9	0.1	1.9	2,6	2.9	2.9	2.2	4.9	4.5	**2004-03-04**
After the revisions round in 2003 (1st Q)	**2004-06-11**	2.6	1.4	3.3	3.9	1.4	2.3	0.4	1.8	2.7	2.9	2.9	2.5	4.3	4.5	**2004-08-10**
Difference short-run revision round		-0.3	1.1	1.9	2.5	0.2	0.1	0.3	0.2	0.3	-0.3	-1.3	0.5	-0.5	0.0	

Note: The shaded areas cover the four-year period of annual revisions that arise from the GDP revision cycle. In Canada, the SNA revisions are usually made available with the release of the 1st quarter, while in the United States it is published with the preliminary estimates of the second quarter.

Table 2. Average annual growth of labour productivity—business sector—Canada and United States—1987-2002

	Canada	United States
1989-2000	1.8	2.1
2000-2003	1.4	3.8

Source: U.S. data are from the Bureau of Labor Statistic (BLS), Productivity and Costs, Second quarter 2004, published in NEWS, August 10. Canadian data refers to the Daily release of June 11, 2004.

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